

REMARKS

The Office Action dated February 9, 2005, has been received and reviewed.

Claims 1-33 are currently pending and under consideration in the above-referenced application, each standing rejected.

Reconsideration of the above-referenced application is respectfully requested.

Objection to the Abstract

The Office has objected to the abstract because it does not discuss the subject matter to which the claims of the above-referenced application are drawn. The abstract has been amended to provide a non-limiting, general description of the claimed subject matter. Accordingly, withdrawal of the objection is respectfully requested.

Claim Amendments

The revisions to the claims that are presented in this Amendment are made merely for the sake of clarity. They have not been made in response to an Office rejection. Therefore, the revisions do not narrow the scope of any of the claims.

Rejections Under 35 U.S.C. § 102

Claims 1-5, 8, 9, 13-25, 28-30, 32, and 33 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent Application Publication US 2001/0032111 A1 of Jensen, Jr., et al. (hereinafter "Jensen").

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Independent claim 1 is directed to a method for supporting a substrate during programmed material consolidation of one or more objects on or adjacent to the substrate. The

substrate is secured to a support surface and unconsolidated material is prevented from contacting a bottom surface of the substrate.

Jensen lacks any express or inherent description of a method for supporting a substrate during programmed material consolidation of one or more objects on or adjacent to the substrate. Instead, the description of Jensen is quite clearly limited supporting a substrate during chemical-mechanical polishing (CMP) processes. *See* Paragraphs [0042] and [0043].

Although a programmed material consolidation process, specifically stereolithography, may be used to fabricate a support (*see* Paragraphs [0049] and [0050]), Jensen does not expressly or inherently describe that the support may be subsequently used to support a substrate as stereolithography or another programmed material consolidation processes is subsequently used to fabricate an object on the substrate. Further, although Jensen describes that the stereolithographically fabricated support may “prevent ingress and trapping of particles between [a] film [thereon] and the back surface of [a] wafer or substrate” carried thereby (Paragraph [0043]), Jensen does not expressly or inherently describe that unconsolidated material may be prevented from contacting the back side of a substrate during a programmed material consolidation process.

As Jensen does not anticipate each and every element of independent claim 1, under 35 U.S.C. § 102(b), the subject matter to which independent claim 1 is directed is allowable over the subject matter described in Jensen.

Claims 2-5, 8, 9, and 13-21 are each allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

Claim 3 is further allowable because the description of Jensen (*see* FIG. 5) is limited to placing a periphery of a substrate *next to* a retention wall of a support apparatus. Jensen lacks any express or inherent description of disposing a retention lip *over* at least a portion of a periphery of a substrate.

Claim 4 is additionally allowable since Jensen does not expressly or inherently describe disposing a retention lip in contact with at least a portion of a periphery of a substrate.

Claim 8 is also allowable because Jensen neither expressly nor inherently describes positioning a preformed retention lip over at least a portion of a periphery of a substrate.

Claim 18 is further allowable because Jensen includes no express or inherent description of applying a positive pressure to the bottom surface of a substrate to remove the same from a support surface. Rather, the description of Jensen is limited to “[c]hanging the vacuum or pressure . . .”

Claim 19 depends from claim 18 and is also allowable since Jensen lacks any express or inherent description of creating a circular air flow beneath the bottom surface of a substrate to effect removal of the substrate from the support surface.

Claim 20, which depends from claim 19, is additionally allowable since Jensen does not expressly or inherently describe that a substrate may be caused to hover over a support surface. A combination of conditions must be present to cause a substrate to hover over a support surface; otherwise, the substrate could merely be ejected from the support surface.

Claim 21 is further allowable since Jensen does not expressly or inherently describe applying force the bottom surface of a substrate to remove the same from a support surface.

Independent claim 22 recites a method recites a programmed material consolidation method. The method of independent claim 22 includes positioning at least one substrate in a receptacle of a retention system such that a raised periphery of the retention system laterally surrounds the at least one substrate. Unconsolidated material is introduced onto a surface of the at least one substrate, then at least portions of the unconsolidated material are programmably consolidated.

Again, with respect to programmed material consolidation, the description of Jensen is limited to use of stereolithography processes to fabricate a support for use in CMP processes. Jensen includes no express or inherent description of a programmed material consolidation process that includes positioning a substrate within a receptacle of a retention system and programmably consolidating previously unconsolidated material on the substrate. Therefore, Jensen does not anticipate each and every element of independent claim 22, as would be required to maintain the 35 U.S.C. § 102(b) rejection that has been presented against independent claim 22.

Each of claims 23-25, 28-30, 32, and 33 is allowable, among other reasons, for depending directly or indirectly from claim 22, which is allowable.

Claim 23 is further allowable because Jensen neither expressly nor inherently describes forming a layer of unconsolidated material of desired thickness over a substrate, then selectively consolidating regions of the layer. The description of Jensen is limited to applying CMP solutions to substrates, without any specifics regarding layer thickness and without consolidating the CMP solutions.

Claim 24 depends from claim 23 and is additionally allowable since Jensen does not expressly or inherently describe repeating the acts of forming a layer and selectively consolidating regions of the layer. Jensen does not describe performing these acts once, let alone two or more times.

Claim 25 is also allowable because Jensen does not expressly or inherently describe filling a receptacle of a retention system with unconsolidated material. As FIG. 5 of Jensen clearly illustrates, the receptacle of the retention system disclosed in Jensen is completely filled with a mounting film 26 and a substrate 20. This is because, in the method described in Jensen, the upper surface of the substrate 20 must be assessable to a polishing pad.

See Paragraph [0042].

Claim 28 is additionally allowable since Jensen does not expressly or inherently describe spraying unconsolidated material onto at least a portion of a substrate. Instead, the only description of spraying or anything similar in Jensen is the deposition of droplets, layer-by-layer, to form a polishing pad for use in CMP processes. Paragraph [0046]. The droplets are not introduced onto a supported substrate.

Claim 29 is further allowable because Jensen does not expressly or inherently describe introducing unconsolidated material onto a substrate by laminar flow. The description of Jensen is limited to use of jetted printing processes, which, according to Jensen, include deposition of droplets, to form polishing pads or wafer supports for use in CMP processes.

See Paragraphs [0046] and [0049]. Neither of these free-standing articles is formed by introducing unconsolidated material on or adjacent to a substrate.

Claim 30 is also allowable because Jensen does not expressly or inherently describe that unconsolidated material is not introduced onto structures that protrude from a substrate. Rather, the description of Jensen is limited to use of programmed material consolidation processes that include dispensing unconsolidated material in such a way as to form raised areas of a polishing pad. Paragraph [0046].

Claim 32 is further allowable since Jensen neither expressly nor inherently describes preventing unconsolidated material from contacting a bottom surface of at least one substrate while unconsolidated material is introduced into a receptacle of a retention system. Again, the description of Jensen is limited to use of the disclosed support apparatus in CMP processes, not in programmed material consolidation processes. Furthermore, Jensen lacks any express or inherent description of effecting programmed material consolidation processes upon a substrate.

Therefore, the 35 U.S.C. § 102(b) rejections of claims 1-5, 8, 9, 13-25, 28-30, 32, and 33 should be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 6, 7, 10-12, 26, 27, and 31 have been rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over the subject matter taught in Jensen, in view of teachings from U.S. Patent 6,463,349 to White et al. (hereinafter "White").

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Each of claims 6, 7, and 10-12 is allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

Claims 26, 27, and 31 are each allowable, among other reasons, for depending directly or indirectly from claim 22, which is allowable.

It is further submitted that there are a number of reasons that the asserted combination of reference teachings do not support a *prima facie* case of obviousness against any of the claims of the above-referenced application.

First, the teachings of White are clearly focused on processes for producing objects from engineering metals. *See* White, col. 1, lines 35-43. White very plainly teaches that the stereolithography processes of the type disclosed in Jensen are not useful for this purpose. *See id.* Thus, White teaches away from the asserted combination of references teachings.

Second, neither Jensen nor White, taken together or separately, teaches or suggests each and every element of several of the claims.

With respect to claim 6, Jensen and White both lack any teaching or suggestion of use of a programmed material consolidation process to form a retention lip on a support for a substrate, over a periphery of the substrate.

Jensen and White also lack any teaching or suggestion of use of stereolithography to form such a retention lip, as required by claim 7.

Additionally, neither Jensen nor White teaches or suggests disposing at least one extension element on an upper surface of a raised element of a substrate support, as recited in claim 10, of fabricating such an extension by a programmed material consolidation process, as required by claim 11, or that the programmed material consolidation process may be stereolithography, as recited in claim 12.

Further, Jensen and White both lack any teaching or suggestion of planarizing a surface of unconsolidated material with a meniscus blade or an air knife. While White discloses that a knife may be used to mechanically planarize the surface of unconsolidated metal powder, White does not disclose that a meniscus blade or an air knife may be used to planarize the surface of the metal powder disclosed therein. A meniscus blade would not be useful for this purpose since meniscus blades are useful with liquids, and metal powder is not a liquid. An air knife would be

problematic since the positive pressure generated thereby may create a dust storm from the metal powder. For these reasons, neither Jensen nor White teaches or suggests each and every element of claim 27.

Claim 31 is further allowable because, although White teaches material subtraction, White does not teach or suggest that excess unconsolidated material may be removed from a receptacle within which a substrate is supported.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections of claims 6, 7, 10-12, 26, 27, and 31 is respectfully requested.

CONCLUSION

It is respectfully submitted that each of claims 1-33 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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